

Note: Objective part is compulsory. Attempt any three questions from subjective part.

#### Objective Part (Compulsory)

(2\*8)

Q.1. Write short answers of the following in 2-3 lines of each on your answer sheet.

- What is Data Warehouse?
- What is database management system?
- What is data independence?
- What is composite identifier?
- What is degree of relationship?
- Write down the limitations of hierarchical and network model?
- Explain the Multivalued Attribute.
- What is data dictionary?

#### Subjective Part (3\*8)

Q.2. Explain the functions of each of the following SQL keywords using sample SQL queries (or a single SQL query if you prefer).

- a) COUNT      b) GROUP BY      c) HAVING      d) INNER JOIN      e) IN      f) LIKE

Q.3. Explain Degree and Cardinality of Relationships with example.

Q.4. Convert the following table into 3rd normal form:

Patient ID	Name	Address	Visit Date	Physician	Diagnosis	Treatment
p-100809	Ali	32-M Model Town Lahore	12-02-2007	Dr. Zahid	Chest infection	Free
			20-02-2007	Dr. Fareeq	Cold	Free
			29-02-2007	Dr. Rehan	Hepatitis-A	Paid
			15-03-2007	Dr. Liaqat	Eyes infection	Free
p-200145	Naila	9-Jail Road Lahore	10-01-2007	Dr. Liaqat	Bone Fracture	Paid
			15-02-2007	Dr. Khushi	Cough	Free
			25-03-2007	Dr. Ayesha	Flu	Free

Q.5. Draw EE-R model of the following:

A person may be employed by one or more organizations, and each organization may be the employer of one or more persons. An organization can be an internal organizational unit or an external organization. For persons and organizations, we want to know their ID, name, address, and phone number. For persons, we want to know their birth date, and for organizations, we want to know their budget number. For each employment, we want to know the employment date, termination date, and bonus. Employment of a person by an organization may result in the person holding many positions over time. For each position, we want to know its title, and each time someone holds that position, we need to know the start date and termination date and salary. An organization is responsible for each position. It is possible for a person to be employed by one organization and hold a position for which another organization is responsible.

Q.6. Write SQL commands for each of the following queries:

#### Relations:

- Classes (class, type, country, numGuns, bore, displacement)
- Ships (name, class, launched)
- Battles (name, date)
- Outcomes (ship, battle, result)

#### Queries:

- Find the number of battleship classes.
- Find the average number of guns of battleship classes.
- Find the average of guns of battleships. Note the difference between (b) and (c); do we weight a class by the number of ships of that class or not?
- Find for each class the year in which the first ship of that class was launched.
- Find for each class the number of ships of that class sunk in battle.